

**Docket Number: TM-05-14 RIN 0581-AC57 National Organic Program (NOP) – Access to Pasture (Livestock).**

**Dear Mark Bradley:**

I work as Coordinator for Organic Agriculture Outreach for the University of Minnesota, and have served on the Minnesota Department of Agriculture's Organic Advisory Task Force since 1991. I was raised on a dairy farm, have worked as an organic inspector for 19 years, and recently completed a 5-year term on the National Organic Standards Board.

I am pleased to offer comments on Docket # TM-05-14. As a resident of Minnesota, I am proud to let you know that Minnesota has a vibrant and growing organic livestock sector, and we have a long history of support for organic agriculture. This August 23-25, we will host the 1<sup>st</sup> IFOAM International Conference on Animals in Organic Production, to be held at the University of Minnesota's St. Paul campus.<sup>1</sup>

I would like to begin by endorsing the comments submitted by NODPA, MODPA, and WODPA, which represent the positions of the vast majority of organic dairy producers in the United States. I will not repeat their responses to the detailed questions in the ANPR.

As you are aware, pasture is a keystone issue for the integrity of organic agriculture. Recent surveys by Consumers Union and the Center for Food Safety show that over 50% of consumers who buy organic dairy products would discontinue their purchases if they knew that their "organic" milk came from confinement operations.

The importance of pasture to organic consumers was also demonstrated in marketing studies presented at the recent USDA-sponsored Organic Dairy Symposium.<sup>2</sup> Failure to clarify and enforce pasture requirements will likely undermine confidence in other organic products, hurting the entire organic sector.

While the Organic Foods Production Act does not specifically mention pasture, section 6509(d)(2) states that the NOSB shall recommend to the Secretary additional livestock standards. The NOSB has consistently submitted recommendations since 2001 urging that the pasture requirements be clarified and strengthened. Since it was never posted for public comment, I have attached the current NOSB draft recommendation on pasture, adopted by the NOSB on November 17, 2005. (Addendum A)

Pasture is already required under sections 205.237(a), 205.238(a)(3), 205.239(a), and 205.239(a)(2) of the NOP regulation. "Pasture" is well defined in section 205.2 as "land used for livestock grazing that is managed to provide feed value and maintain or improve soil, water, and vegetative resources."

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<sup>1</sup> [http://www.ifoam.org/events/ifoam\\_conferences/IFOAM\\_Animal\\_Production\\_Conference.html](http://www.ifoam.org/events/ifoam_conferences/IFOAM_Animal_Production_Conference.html)

<sup>2</sup> <http://www.ams.usda.gov/nop/PublicComments/DairyPastureSymposium/MaryEllenMolyneux.pdf>,  
<http://www.ams.usda.gov/nop/PublicComments/DairyPastureSymposium/MargaretWittenbergPresentation>

The questions that need to be answered are: How much pasture is required? How should compliance be measured? And, how should the regulation be enforced?

Quantifiable requirements are needed. The regulation already has numerous quantifiable requirements in other sections – 36 months with no prohibited substances for land prior to organic certification; 90 days after use of a parasiticide prior to milking; 90-120 days after application of raw manure before harvest of an organic crop; C:N ratios, times, temperatures, and turns for compost; 95% organic content for “organic “ labeling, etc., etc.

It is reasonable that existing pasture requirements be enhanced by incorporating quantifiable measurements of a minimum of 30% dry matter intake (DMI) for at least 120 days of pasture during the growing season, as recommended by the National Organic Standards Board.

Enhancing the quantifiable requirements will mean that livestock producers will need to maintain records of pasture management. Fortunately, both the rule and the OFPA require that records be kept of the feed fed to organic animals and of the management practices used by certified operations to demonstrate compliance. (205.103(b) and 205.236(c))

It is important to note that European countries have pasture requirements as part of their organic standards. For example, the Danish regulation reads "*All animals shall, in the period from 15<sup>th</sup> April to 1st November, have access to grazing a minimum of 150 days. Exceptions are animals in their first weeks of life where they can be kept indoors and slaughter pigs after weaning and bulls older than 1 year. Calves younger than 4 month old can be kept indoors. Calves between 4 and 6 month old must have access to pasture in the period from May 1st to September 1st when weather permits*".<sup>3</sup>

The European Union Organic Standard includes the following:

4.7. *Rearing systems for herbivores are to be based on **maximum** use of pasturage according to the availability of pastures in the different periods of the year.*

8.3.1. *Subject to the provisions in paragraph 5.3., all mammals must have access to pasturage or an open-air exercise area or an open-air run which may be partially covered, and they must be able to use those areas whenever the physiological condition of the animal, the weather condition and the state of the ground permit, unless there are Community or national requirements relating to specific animal health problems that prevent this. **Herbivores, must have access to pasturage whenever conditions allow.***

8.3.4. *By way of derogation from paragraph 8.3.1., the **final fattening phase of cattle pigs and sheep for meat production** may take place indoors, provided that this indoors period does not exceed one fifth of their lifetime and in any case **for a maximum period of three months.***

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<sup>3</sup> Translation from Danish to English provided by Torben W. Bennedsgaard, DVM, PhD with the Danish Institute of Agricultural Science

In response to the final three questions in the ANPR, I offer the following specific comments:

**1) Is the current role of pasture in the NOP regulations adequate for dairy and livestock under principles of organic livestock management and production? Is the role of pasture adequate for other types of organic livestock?**

Answer: Enforcement of current pasture requirements is not adequate. Pasture requirements for dairy and other ruminant livestock are consistent with the principles of organic livestock production.

The NOSB Principles of Organic Production and Handling state, “The basis for organic livestock production is the development of a harmonious relationship between land, plants, and livestock, and respect for the physiological and behavioral needs of livestock.”

Ruminant animals are, by definition, grazing animals. As demonstrated by numerous speakers during the recent Pasture Symposium, the natural behavior of ruminant animals is to graze pasture. Grazing has positive health effects for the animals and for the humans who consume their products.

The role of pasture needs to be more clearly defined for all ruminant livestock, including beef and dairy animals, to assure that the requirements are uniformly met and enforced.

**2) If the current role of pasture as it is described in the NOP regulations is not adequate in your opinion, explain what factors should be considered to improve the role of pasture within the NOP regulations. Provide any available evidence that supports your view.**

Answer: I support the recommendations submitted by the NOSB which state that “ruminants should graze pasture for a minimum of 120 days per year except during certain stages of life: birthing, dairy animals up to 6 months of age and beef animals during a final finishing stage. The producer of an organic operation must not prevent dairy animals from grazing pasture during lactation.”

Along with a minimum number of days, there should also be a minimum measurable amount of Dry Matter Intake (DMI) on a per animal, per day basis, during the growing season. That minimum amount should be 30% for all ruminants over 6 months of age. The only exception to this rule should be for dairy animals for birthing, those animals less than 6 months of age, or inclement weather including drought or flooding typically lasting only a few days at a time during the grazing season, and for the finishing of beef animals, not to exceed 90 days of confinement.

There has been much evidence submitted to the NOSB and NOP to support the need for stricter pasture standards and associated benefits (soil health, livestock health, energy usage, consumer confidence & assurance, nutritional benefits). The NOSB provided a

thorough review in their November 17, 2005 board draft recommendation and has been recommending clearer pasture standards for over 5 years. Addenda A5 and A6 contain lists of scientific citations supporting pasture and its benefits.

- 3) **Which parts of the NOP regulations should be changed to address the role of pasture in organic livestock management? Pasture appears in the NOP definitions (subpart B, § 205.2), and in subpart C of production and handling requirements under livestock feed (§ 205.237), livestock healthcare (§ 205.238), and livestock living conditions (§ 205.239). Should the organic system plan requirements (§ 205.201) be changed to introduce a specific means to measure and evaluate compliance with pasture requirements for all producers of dairy or other livestock operations? Or, should a new standard be developed just for pasture alone?**

Answer: In addition to the 120 day grazing requirement recommended by the NOSB, a minimum DMI requirement of 30% edible pasture during the 120 days that the ruminants 6 months and older are grazing, should be added.

Changes to the regulation should be made as follows:

#### Subpart A - Definitions

Growing season for pasture. The time(s) of year when pasture growth is possible from natural precipitation or irrigation.

Dry matter intake (livestock feed). The quantity of total feed intake measured on a moisture-free basis in order to provide a consistent basis for comparison.

#### **§ 205.237 Livestock feed.**

(b) The producer of an organic operation must not:

(7) Prevent dairy animals from grazing pasture during lactation, except as allowed under §205.239(b).

(c) Ruminant livestock must graze pasture for the growing season but not less than 120 days per year. The grazed pasture must provide a significant portion of the total feed requirements but not less than 30% of the dry matter intake on an average daily basis during the growing season.

#### **§ 205.239 Livestock living conditions.**

(a) The producer of an organic livestock operation must establish and maintain livestock living conditions which accommodate the health and natural behavior of animals, including:

(1) Access to the outdoors, shade, shelter, exercise areas, fresh air, and direct sunlight suitable to the species, its stage of ~~production~~life, the climate, and the environment;

(2) Access to pasture for ruminants, as required in 205.237(c).

(b) The producer of an organic livestock operation may provide temporary confinement for an animal because of:

(2) The animal's stage of ~~production~~life; for ruminants this includes only:

(i) birthing;

(ii) dairy animals up to 6 months of age; or

(iii) beef animals during a final finishing stage not to exceed 90 days.

There should be specific means to measure and evaluate compliance with pasture requirements for all producers of dairy or other *ruminant* livestock operations. Such operations will need to describe their pasture systems, including management, pasture acreages, animal numbers, and planned DMI intake, in their organic system plans.

This does not mean that the organic system plan requirements in 205.201 need to be changed, since a producer is already required to submit information on: 1) “a description of all practices and procedures to be performed and maintained, including the frequency...” 2) a list of each substance...” 3) “a description of the monitoring practices...” 4) a description of the recordkeeping system...” a description of the management practices and physical barriers...” and 6) “additional information deemed necessary by the certifying agent to evaluate compliance...”

As mentioned, sections 205.103(b) and 205.236(c) of the rule and 6509(f)(2) of the OFPA already require that records be kept of the feed fed to organic animals and of the management practices used by certified operations to demonstrate compliance. There is no need to change recordkeeping requirements.

What will be needed will be revised organic system plan forms for livestock operations with ruminant animals to assure that adequate information is being consistently gathered and assessed by accredited certifying agents. Fortunately, the NOP has contracted with the National Center for Appropriate Technology for the development of such forms. As a member of the stakeholder team helping develop the forms, I am pleased to report that the forms are nearing completion, and should be presented to the NOSB at the Fall 2006 meeting.

Standardized tools will also be needed to assess dry matter intake. The NOP should consult with the NOSB, and then issue guidance to livestock producers and accredited certifying agents on standardized organic system plan forms and DMI assessment tools. I have included two examples of DMI assessment tools as Addenda B and C.

## **Conclusion**

Once again, I appreciate the chance to comment. I strongly support clarifying, strengthening, and enforcing pasture requirements for organic ruminants. The proposed 120 days with 30% dry matter intake is a verifiable and reasonable minimum standard that is supported by dairy farmers and consumers. I urge the USDA to move forward with proposed rulemaking in the near future and put this issue to rest.

Respectfully submitted,

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**Addendum A**  
**NOSB Livestock Committee Recommendation for Rule Change**  
**Pasture Requirements for the National Organic Program**  
**Presented by the Livestock Committee to the NOSB**

**Adopted as a Board Draft for Posting**  
**12 yes, 1 no, 1 abstain**  
**November 17, 2005**

**Introduction:**

On August 14, 2005, the USDA National Organic Program (NOP) returned two recommendations (Addenda B and C) for rule change adopted by the NOSB on March 2, 2005. In returning the documents, the NOP stated that the recommendations "lacked regulatory objectives." The Livestock Committee has revised the recommendations based on comments received and has expanded the "Background" section to clarify the Board's regulatory objectives.

In order to assure consumers that organic livestock products are produced to meet a consistent standard, the NOSB, as authorized by section 2110(d)(2) of the Organic Foods Production Act, recommends that 7 CFR Part 205 be amended.

The regulatory objectives of the Livestock Committee's revised recommendation are to establish pasture requirements that:

1. Are clear, consistent, and enforceable;
2. Apply to all regions of the country;
3. Are scale neutral;
4. Are attainable by organic livestock producers;
5. Protect soil and water quality and minimize soil erosion;
6. Promote the health and natural behavior of livestock; and
7. Meet consumer expectations.

**Background:**

The NOSB has made numerous recommendations to clarify pasture requirements for organic livestock operations. In June 2000, the NOSB recommended that, "the allowance for temporary confinement should be restricted to short-term events such as

birthing of newborn or finish feeding for slaughter stock and should specifically exclude lactating dairy animals.” (Preamble to Final Rule, page 80573)

In October 2001, the NOSB adopted a pasture recommendation that stated, in part: “1. Ruminant livestock must have access to graze pasture during the months of the year when pasture can provide edible forage, and the grazed feed must provide a significant portion of the total feed requirements. The Farm Plan must include a timeline showing how the producer will work to maximize the pasture component of total feed used in the farm system.

3. The producer of bovine livestock may be allowed exemption to pasture during the following stages of production: a. Dairy stock under the age of 6 months; and b. Beef animals during final stage of finishing for no more than 120 days.” (Addendum A1.)

On March 2, 2005, the NOSB adopted two recommendations for rule change. The first recommendation (Addendum A2) advised that the phrase “access to pasture for ruminants” at 205.239(a)(2) be changed to “ruminant animals grazing pasture during the growing season.” The recommendation also contained exemptions from the pasture requirement during birthing, for dairy calves up to 6 months of age, and for finishing beef animals for no more than 120 days. The recommendation specifically prevented organic livestock operators from denying pasture to dairy cows during lactation.

The second recommendation adopted by the NOSB on March 2, 2005, (Addendum A3) advised that the term “stage of production” in 205.239(a)(1) and (b)(2) be changed to “stage of life” to be consistent with the text used in 205.237(a)(2).

On August 16, 2005, the NOSB adopted a recommendation (Addendum A4) for guidance clarifying the types of information to be included in a livestock operation’s Organic System Plan to assess compliance with pasture requirements; the limitations of “temporary confinement”; and tools to assess “appropriate pasture conditions.”

The NOSB has received thousands of comments in support of its draft recommendations. The preponderance of supportive comments have been submitted by dairy producers and consumers, stressing the environmental, animal health, and nutritional benefits derived from pastured ruminants.

Several comments have been received in opposition to NOSB draft recommendations. Those comments focused on the need for flexibility in pasture requirements in order to expand the number of acres in organic production.

The Livestock Committee has reviewed scientific studies concerning the health impacts of pasture vs confinement systems. The committee also reviewed studies on the nutritional qualities of products from pastured animals compared to products from confined animals.

The Livestock Committee reports the following:

1. Addendum A5 contains citations to scientific studies that document the benefits to animal health when ruminants are pastured. For example, pastured cows had lower somatic cell counts (SCC), fewer services per conception, and shorter calving intervals than confined cows. Udder diseases, including clinical mastitis, udder edema, and teat injuries were consistently less in herds managed on

- pasture compared with herds managed in confinement. In another study, researchers found fewer hoof disorders and eye disease in pastured vs. confinement herds.
2. Addendum A5 also cites studies showing benefits to food safety and milk quality from pastured animals. For example, pastured herds had lower bulk milk total bacteria counts than confinement herds.
  3. Nutritional benefits of products from pasture-raised livestock are also cited in Addendum A5. One study found that organic milk was 50% higher in Vitamin E, 75% higher in beta carotene and higher in omega 3 essential fatty acids than conventional milk. This study tied these qualities to organic cows having room to graze and a diet high in fresh grass and clover, and forage and less maize (corn). Intensively pastured cows produced milk with CLA concentrations that were about 3- to 4-fold greater than initial concentrations. Ribeye steaks from cattle finished on a combination of pasture and concentrate were higher in CLA content than steaks from cattle finished on conserved forages plus concentrates.
  4. Addendum A6 cites research on the soil benefits from grazing dairy cows. As stated, grains used for livestock feed are all annuals and the soil must be tilled and planted each year, causing erosion from the tilled soil, carbon release from plowing, and the loss of organic matter. When pastured, the cows' manure is deposited on the sod where it is incorporated immediately into the soil by the biological life of the soil. In confinement operations not only is the feed stored but also the manure must be stored, with the eventual loss of gasses such as ammonia and sulfur dioxide. In addition, pasture secures the soil with its root mass to protect it from erosion caused by wind and rain.

### **Final Rule Citations Relevant to Pasture (*emphasis added*)**

#### 205.2 Terms defined.

Pasture. Land used for livestock grazing that is managed to provide feed value and maintain or improve soil, water, and vegetative resources.

#### § 205.203 Soil fertility and crop nutrient management practice standard.

(a) The producer must select and implement tillage and cultivation practices that maintain or improve the physical, chemical, and biological condition of soil and **minimize soil erosion**.

#### § 205.237 Livestock feed.

(a) The producer of an organic livestock operation must provide livestock with a total feed ration composed of agricultural products, **including pasture and forage**, that are organically produced and, if applicable, organically handled: Except, That, nonsynthetic substances and synthetic substances allowed under § 205.603 may be used as feed additives and supplements.

#### 205.238 Livestock health care practice standard.

- (a) The producer must establish and maintain preventive livestock health care practices, including:
- (3) Establishment of appropriate housing, **pasture conditions**, and sanitation practices to minimize the occurrence and spread of diseases and parasites;



205.239 Livestock living conditions.

- (a) The producer of an organic livestock operation must establish and maintain livestock living conditions which accommodate the health and ***natural behavior of animals***, including:

- (2) ***Access to pasture for ruminants:***

- (b) The producer of an organic livestock operation may provide ***temporary*** confinement for an animal because of:

- (1) Inclement weather;
- (2) The animal's stage of production;
- (3) Conditions under which the health, safety, or well being of the animal could be jeopardized; or
- (4) Risks to soil or water quality.

**Preamble to the Final rule – Citations Relevant to Pasture**

"The definition of "pasture" we included emphasizes that livestock producers must manage their land to provide nutritional benefit to grazing animals while maintaining or improving the soil, water, and vegetative resources of the operation. The producer must establish and maintain forage species appropriate for the nutritional requirements of the species using the pasture." Preamble page 80571

"A producer must provide livestock with a total feed ration composed of agricultural feed products, including pasture and forage that is organically produced." Preamble page 80572

"In the final rule, temporary confinement refers to the period during which livestock are denied access to the outdoors. The length of temporary confinement will vary according to the conditions on which it is based, such as the duration of inclement weather. The conditions for implementing temporary confinement for livestock do not minimize the producer's ability to restrain livestock in the performance of necessary production practices. For example, it is allowable for a producer to restrain livestock during the actual milking process or under similar circumstances, such as the administration of medication, when the safety and welfare of the livestock and producer are involved." Preamble page 80574

**Recommendation:**

The NOSB reaffirms its support for the positions taken by the Board in June 2000 and October 2001, as stated above, and the recommendations adopted by the Board on August 16 and March 2, 2005.

**In revision, the NOSB recommends the following:**

1. The NOSB recommends that §205.239(a)(2) be amended to read:

§205.239(a) The producer of an organic livestock operation must establish and maintain livestock living conditions which accommodate the health and natural behavior of animals, including:

(2) ~~Access to pasture for ruminants;~~ Ruminants shall graze pasture for at least 120 days per year, except during the following stages of life:

(i) birthing;

(ii) dairy animals up to 6 months of age; or

(iii) beef animals during a final finishing stage not to exceed 120 days.

2. The NOSB recommends that §205.239(a)(1) be amended to read:

§205.239(a) The producer of an organic livestock operation must establish and maintain livestock living conditions which accommodate the health and natural behavior of animals, including:

(1) Access to the outdoors, shade, shelter, exercise areas, fresh air, and direct sunlight suitable to the species, its stage of ~~production-life~~, the climate, and the environment;

3. The NOSB recommends that §205.239(b)(2) be amended to read:

§205.239(b) The producer of an organic livestock operation may provide temporary confinement for an animal because of:

(2) The animal's stage of ~~production-life~~;

4. The NOSB recommends that §205.237(b) be amended by adding a new section (7) to read:

(b) The producer of an organic operation must not:

(7) Prevent dairy animals from grazing pasture during lactation, except as allowed under §205.239(b).

**Committee vote:**

4 yes, 1 no, 1 absent

**Addendum A1: NOSB Recommendation – Adopted October 17, 2001**  
**Pasture**  
**Livestock Committee Recommendation**  
**October 17, 2001**

The NOSB Livestock committee puts forth the following proposed wording as a clarification for the present “access to pasture for ruminants” in the Final Rule. The following addresses what we see as the intent, the benefits, the recommended standard and the references in the NOP Final Rule related to the requirement of pasture for ruminants.

**Intent:**

The intent of requiring pasture for ruminants is to ensure an organic production system that provides a living condition that allows the animal to satisfy their natural behavior patterns, provides preventative health care benefits and answers the consumer expectation of humane animal care. The intent is to incorporate a pasture plan as a required part of the organic livestock system plan.

Pasture management fulfills an integral role in nutrition, health care and living condition requirements of organic ruminant production. Pasturing represents a complex task of applying the organic principles to an organic livestock operation. Pasture management in recent decades has evolved and like organic also requires a management plan for effective implementation.

Organic pasture management reflects a synthesis of crop and livestock production principles that works from the soil up to promote an interdependent community of plants and ruminants. Organically managed pasture should produce the quantity and quality of edible plants suitable to the species, stage of production, and number of animals. Pasture contributes to preventive health care management by enabling ruminants to develop and reproduce under conditions that reduce stress, strengthen immunity, and deter illness. Pasture affords ruminants the freedom of choice to satisfy natural behavior patterns. Pasture assures a relationship between the animal and land that satisfies both organic principles and international standards for organic livestock.

**Benefits:**

Pasture provides many benefits to the organic livestock farm. Significant benefits gained by pasturing ruminants are in the following areas:

**Herd health** -- Common benefits associated with pasture are improved feet and leg strength, less breeding problems, lower culling rates and enhanced immunity.

**Environmental**-Animals walking to pasture saves non-renewable energy, reduces equipment needs, spreads manure out naturally avoiding concentration of manure. Water pollution is a primary concern of organic consumers and concentrated manures from livestock production can be a major source of pollution to water sources.

**Production**-Pasturing can be as productive as dry lot production. While pasture may not produce record amounts of milk or the fastest growth rate for beef animals, net returns are favorable when all factors are measured.

**Consumer expectation**-The public comment from the two proposed rules shows a clear expectation that consumers have for pasture for ruminant livestock as part of humane livestock practices. There are food health and safety benefits from pasture produced livestock products that are important to the organic consumer.

**NOSB LIVESTOCK COMMITTEE RECOMMENDED STANDARD****ACCESS TO PASTURE FOR RUMINANTS:**

1. Ruminant livestock must have access to graze pasture during the months of the year when pasture can provide edible forage, and the grazed feed must provide a significant portion of the total feed requirements. The Farm Plan must include a timeline showing how the producer will work to maximize the pasture component of total feed used in the farm system.

2. The producer of ruminant livestock may be allowed temporary exemption to pasture because of:

a. Conditions under which the health, safety, or well-being of the animal could be jeopardized.

b. Inclement weather

c. Temporary conditions which pose a risk to soil and water quality.

3. The producer of bovine livestock may be allowed exemption to pasture during the following stages of production: [Note: recommendations for other ruminant livestock are being developed]

a. Dairy stock under the age of 6 months

b. Beef animals during final stage of finishing for no more than 120 days

#### **Implementation issues:**

Organic pasture management should respond to site-specific conditions by integrating cultural, biological, and mechanical processes that foster cycling of resources, promote ecological balance, and conserve biodiversity. Site-specific conditions in organic pasture management include the area of land available for grazing, the land's pasture carrying capacity, its suitability to accommodate the natural behavior of the herd, and its capacity to recycle the animals' waste. Organic ruminant producers must develop an organic system plan that correlates their intended practices with the site-specific conditions on their operation. Natural variation in climate, topography, precipitation, vegetation, and breed selection may mean organic system plans may vary widely. Nevertheless, because all organic pasture systems will be managed through the consistent application of the fundamental principles of cycling resources, promoting ecological balance, conserving biodiversity and promoting livestock's health and well being.

Organic ruminant producers must manage pasture by prioritizing the use of available resources to meet the nutritional, behavioral, and waste recycling requirements of the grazing herd. Land that normally produces stored feed may have to be converted to pasture to maximize pasture for the corresponding herd size. Producers may use allowed crop production practices such as seeding and the application of approved fertilizers and soil amendments to augment the productivity of their pasture. Conversely, producers may maintain no-input systems that provide ruminants with naturally occurring forage. The amount of producer activity is less important than the requirement that the practices that are implemented are consistent with the standards including conservation of the operation's natural resources. Organic ruminant producers will have to adapt the composition and size of their herd to the site-specific conditions of their operation.

## FINAL RULE REFERENCES:

Pasture definition: Land used for livestock grazing that is managed to provide feed value and maintain or improve soil, water, and vegetative resources.

This definition leaves no question that the pasture is not an exercise lot due to the land management issues listed. Inherently this definition requires that adequate acres be supplied for the number of ruminants on the organic farm for the growing season. In order for pasture to maintain or improve soil, water, and vegetative resources it must be managed to avoid overgrazing. Pasture plants, whatever they are, can not be maintained or improved nor can they provide feed value unless the grazing system maximizes growth via the timing of the animals grazing.

Livestock health care practice:

205.238(a)-must maintain preventative livestock health care practices

Recent studies as well as practical experience by producers show significant benefits for livestock health in diverse areas including feet health, breeding, calving and improved immunity.

205.238(a)(3)-establishment of appropriate pasture conditions to minimize the occurrence and spread of diseases and parasites

The same practices that assure satisfying the definition of pasture also satisfy this requirement. Modern pasture management utilizes frequent rotation of pasture which can be timed to disrupt parasite and disease cycle.

Livestock living conditions

205.239(a)-must maintain livestock living conditions which accommodate the health and natural behavior of animals

Pasturing ruminants both satisfies this requirement and satisfies the consumer's perception of organic livestock living conditions.

205.239(a)(2)-access to pasture for ruminants

This standard combined with the definition and the above standards clearly support the requirement listed above.

### **Addendum A2: NOSB Recommendation for Rule Change Pasture Requirements for the National Organic Program Adopted March 2, 2005**

## **Introduction**

The USDA National Organic Program (NOP) has requested NOSB provide guidance concerning the pasture requirements of the National Organic Program that the NOP can review and distribute to accredited certifying agents and post on the NOP website.

The following recommendation is based on the NOSB's June 2000 and October 2001 pasture recommendations and the standards currently required under the NOP regulations, attached in addenda to this document. The NOP Final Rule defines "pasture" as "land used for livestock grazing that is managed to provide feed value and maintain or improve soil, water, and vegetative resources." 7 CFR 205.2. Pasturing is required under the Livestock Health Care Practice Standard (7 CFR 205.238) and under Livestock Living Conditions (7 CFR 239). The Final Rule provides that temporary confinement is allowed in certain circumstances. This recommendation will provide further guidance on the meaning of temporary confinement and stage of life.

As stated in the October 2001 NOSB recommendation, requiring pasture for ruminants ensures an organic production system which provides living conditions that allow animals to satisfy their natural behavior patterns, provides preventative health care benefits and answers the consumer expectation of humane animal care. Organic pasture management reflects a synthesis of crop and livestock production principles that works from the soil up to promote an interdependent community of plants and ruminants. Organically managed pasture should produce the quantity and quality of edible plants suitable to the species, stage of life, and number of animals. Pasture assures a relationship between the animal and land that satisfies both organic principles and international standards for organic livestock.

### **Recommendation**

The NOSB recommends the following:

#### **1. Rule Change for §205.239(a)(2)**

The NOSB recommends that §205.239(a)(2) be amended to read:

§205.239(a)(2) ~~Access to pasture for ruminants~~ Ruminant animals grazing pasture during the growing season.

This includes all stages of life except:

a) birthing; b) dairy animals up to 6 months of age<sup>4</sup> and c) beef animals during the final finishing stage, not to exceed 120 days<sup>5</sup>. Note: Lactation of dairy animals is not a stage of life under which animals may be denied pasture for grazing.

**Board vote:**

**13 – yes, 1 – no, 0 - abstain**

### **Addendum A3: Recommendation for a Rule Change**

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<sup>4</sup> The NOSB recommends 6 months for young animals to allow for weaning and prevention of parasites. (Footnote included as explanatory text – not to be included in rule change.)

<sup>5</sup> The NOSB recommends 120 days for the finishing of bovines based on comments received from beef producers who indicated that 120 days is the amount of time needed to achieve "choice" grades of beef. (Footnote included as explanatory text – not to be included in rule change.)

**Amending “Stage of Production”  
to read “Stage of Life”  
Adopted by the NOSB March 2, 2005**

**Background**

Language within The National Organic Program Final Rule (7 CFR Part 205) creates a certain amount of ambiguity regarding the applicability of specific provisions of the regulation in the lifestage of livestock.

Sections 205.239(a)(1) and 205.239(b)(2) reference “stage of production” in regard to access to outdoors and temporary confinement. Section 205.237 (a)(2) utilizes the terminology “stage of life” to describe the allowance for specific levels of feed supplements or additives.

Development of enforceable standards for “stage of production” is problematic, particularly in regard to dairy animals. While “life” encompasses the total span of an animal’s life, “production” refers only to that portion of life in which the animals is producing milk.

**Recommendation**

The NOSB recommends a rule change to make the language in §205.239(a)(1), §205.239(b)(2) consistent with the language in §205.237(a)(2). The language, therefore in §205.239(a)(1) would read “Access to outdoors, shade, shelter, exercise areas, fresh air, and direct sunlight suitable to the species its stage of ~~production~~life, the climate, and the environment.

§205.239(b)(2) would be amended to read “animal’s stage of ~~production~~life.”

**Board Vote**

**13 – yes, 0 – no, 0 – abstain, 1 - absent**

**Addendum A4: NOSB Livestock Committee Recommendation for Guidance on  
Pasture Requirements for the National Organic Program  
Adopted by the National Organic Standards Board  
August 16, 2005**

**Introduction**

The USDA National Organic Program (NOP) has requested NOSB provide guidance concerning the pasture requirements of the National Organic Program that the NOP can review and distribute to accredited certifying agents and post on the NOP website. The NOSB reviewed the proposed guidance from the Livestock Committee at the March, 2005 meeting, and made several changes. The NOSB then requested additional public comments on the revised guidance.

The NOSB Livestock Committee received and reviewed comments on the revised guidance. The Livestock Committee has revised the guidance to include several of the comments, including clarification of the meaning of growing season, clarification of the

role of the NRCS standards, and certain grammatical issues. A minority opinion on the Livestock Committee sought the inclusion of the word “approximate” in relation to the percentage of DMI to reflect the annualized aspect of the Organic System Plan, however this opinion was not adopted by the Committee. The Livestock Committee will present this guidance to the NOSB at the August meeting and request that the NOSB recommend this guidance to the NOP. The Livestock Committee believes that the guidance, combined with the rule changes recommended at the March 2005 meeting with regard to stage of life and lactation are sufficient, and no further rule changes are recommended at this time.

### **Guidance for interpretation of §205.239(a)(2)**

#### **A. Organic System Plan**

Ruminant livestock should graze pasture during the months of the year when pasture can provide edible forage. The Organic System Plan should have the goal of providing a significant portion of the total feed requirements as grazed feed but not less than 30% dry matter intake on an average daily basis during the growing season but not less than 120 days per year. Growing season means the time of year of pasture growth from natural precipitation or irrigation. The Organic System Plan should include a timeline showing how the producer will satisfy the goal to optimize the pasture component of total feed used in the farm system. For livestock operations with ruminant animals, the operation’s Organic System Plan should describe: 1) the amount of pasture provided per animal; 2) the average amount of time that animals are grazed on a daily basis; 3) the portion of the total feed requirement that will be provided from pasture; 4) circumstances under which animals will be temporarily confined; and 5) the records that are maintained to demonstrate compliance with pasture requirements.

#### **B. Temporary Confinement**

Temporary confinement means the period of time when a ruminant is denied pasture. The length of temporary confinement will vary according to the conditions on which it is based (such as the duration of inclement weather) and instances of temporary confinement should be the minimum time necessary. In no case should temporary confinement be allowed as a continuous production system. All instances of temporary confinement should be documented in the Organic System Plan and in records maintained by the operation.

Temporary confinement is allowed in the following situations:

- 1) During periods of inclement weather such as severe weather occurring over a period of a few days during the grazing season;
- 2) Conditions under which the health, safety, or well being of an individual animal could be jeopardized, including to restore the health of an individual animal or to prevent the spread of disease from an infected animal to other animals; or
- 3) To protect soil or water quality

#### **C. Appropriate Pasture Conditions**

As a tool for the farmer and the certifier, appropriate pasture conditions can be determined by referring to the regional Natural Resources Conservation Service



Conservation Practice Standards for Prescribed Grazing (Code 528) for the number of animals in the Organic System Plan.

Approved by the Livestock Committee July 12, 2005

5 Yes

0 No

0 Abstain

Amended and adopted by NOSB August 16, 2005

13 Yes, 0 No, 1 Absent

## **Addendum A5 – Scientific Studies Comparing Pasture vs Confinement Systems**

### **Benefits to Animal Health**

1. **Bela, B., G. Nagy and I. Vinczeffy. 1995. *The influence of grazing on milk production and productive lifetime.* Debrecen Agricultural University, Dept. of Animal Breeding and Nutrition. Hungary. Poster presentation at 46<sup>th</sup> Annual Meeting of the European Association for Animal Production, Prague, Czech Republic. Pastured cows had lower somatic cell counts (SCC), fewer services per conception and shorter calving intervals than confined cows.**
2. **Bendixen, P.H., B. Vilson, I. Ekesbo, and D.B. Astrand. 1986. *Disease frequencies in dairy cattle in Sweden.* Prev Vet Med. 5: 263. Confinement resulted in increased intramammary infections, udder edema, and stepped on teats.**
3. **Berghaus, R.D., B.J. McCluskey, and R. J. Callan. 2005. *Risk factors associated with hemorrhagic bowel syndrome in dairy cattle.* JAVMA. 226:1700-6. Use of pasture as part of the lactating ration during the growing season was associated with decreased risk for hemorrhagic bowel syndrome.**
4. **Cornell University 2004 Dairy Farm Business Summary. [www.cce.cornell.edu](http://www.cce.cornell.edu) . Cull rates for conventional farms were 29% whereas for organic herds of similar size, it was 22%.**
5. **Eberhart, R. J., R. A. Wilson, E. Oldham and T. Lintner. 1987. *Environmental effects on teat skin microflora.* Proceedings of the 26<sup>th</sup> Annual Mtg. Natl Mastitis Council, Orlando, FL. Populations of environmental pathogens on teat ends were lower in pastured than confined herds.**
6. **Goldberg, J.J., E.E. Wildman, J.W. Pankey, J.R. Kunkel, D.B. Howard, and B.M. Murphy. 1992. *The influence of intensively managed rotational grazing, traditional continuous grazing and confinement housing on bulk tank milk quality and udder health.* J Dairy Sci. 75:96-104. Grazed herds had lower total bulk milk bacteria counts (TBC) than confined herds did in the summer but there was no difference in the winter when all cows were confined. Trends towards fewer udder health problems in grazing herds were also observed.**
7. **Pankey, J.W. 1989. *Improving milk quality and animal health by efficient pasture management.* NESARE final report. LNE89-017.**

- [http://www.sare.org/reporting/report\\_viewer.asp?pn=LNE89-017&ry=1989&rf=0](http://www.sare.org/reporting/report_viewer.asp?pn=LNE89-017&ry=1989&rf=0) (last accessed 11/03/05). Udder disease, including clinical mastitis, udder edema, and teat injuries were consistently less in herds managed on pasture compared with herds managed in confinement.
8. Parker, W. J., L.D. Muller, S.L. Fales, and W.T. McSweeney. 1993. *A survey of dairy farms in Pennsylvania using minimal or intensive pasture grazing systems*. Prof. Anim. Sci. 9:159-165. Authors found fewer hoof disorders and eye disease in herds that pastured vs. confinement.
  9. Regula G., J. Danuser, B. Spycher and B. Wechsler. 2004. *Health and welfare of dairy cows in different husbandry systems in Switzerland*. Prev Vet Med. 15:247-64. Risks for lameness and teat injuries increased with increased confinement. Skin lesions on hocks and carpal joints were decreased in cattle allowed to go out at all times rather than cows that were allowed to go out only in good weather.
  10. Rodriguez-Lainz, A. P. Melendez-Retamal, D.W. Hird, D.H. Read and R.L. Walker. 1999. *Farm- and host-level risk factors for papillomatous digital dermatitis in Chilean dairy cattle*. Prev Vet Med. 42:87-97. Loose housed cows had a higher risk of PDD, followed by cows in freestalls or in open corrals, compared to cows on pasture all year.
  11. Somers, J.G., K. Frankena, E.N. Noordhuizen-Stassen, and J.H. Metz. 2005. *Risk factors for digital dermatitis in dairy cows kept in cubicle houses in The Netherlands*. Prev Vet Med. 71:11-21. Factors increasing risk of digital dermatitis were: restricted grazing time, high concentrate feeding after calving, feeding by-products, infrequent hoof trimming, and housing dry cows with lactating cows before calving.
  12. Somers, J.G., Frankena, K., E. N. Noordhuizen-Stassen and J.H. Metz. 2003. *Prevalence of claw disorders in Dutch dairy cows exposed to several floor systems*. J Dairy Sci 86:2082-93. Cows that were not grazed were at high risk for most claw disorders when compared to cows with pasture access. All herds on concrete flooring were affected by digital dermatitis.
  13. Singh S.S., W.R. Ward, K. Lautenbach, J.W. Hughes, and R.D Murray. 1993. *Behaviour of first lactation and adult dairy cows while housed and at pasture and its relationship with sole lesions*. Vet Rec 133:469-74. Compared lying time and frequency of lying and sole disorders in pastured herd vs. housed. Pastured cows spent more time lying (which translates into more rumination time) and got up and down less frequently than housed cows. No difference in sole disorders.
  14. Waage, S., S. Sviland, and S. A. Odegaard. 1998. *Identification of risk factors for clinical mastitis in dairy heifers*. J. Dairy Sci. 81:1275-84. Heifers kept on pasture in the summer were at a decreased risk for clinical mastitis.
  15. Washburn, S.P., S.L. White, J.T. Green, Jr. and G.A. Benson. 2002. *Reproduction, mastitis and body condition of seasonally calved Holstein and Jersey cows in confinement or pasture systems*. J Dairy Sci. 85:105-

111. There was no difference in reproductive performance between pasture and confinement herds. Pastured herds had lower body condition scores than confinement. However, confinement herds had 1.8 times more clinical mastitis than pastured and eight times the rate of culling for mastitis.
16. **White, S.L., G.A. Benson, S.P. Washburn, J.T. Green Jr. 2002. *Milk production and economic measures in confinement of pasture systems using seasonally calved Holstein and Jersey cows.* J Dairy Sci. 85:95-104** Compared confinement cows on TMR vs pasture based cows. Lower milk production on pasture but decreased feed and labor costs. Also decreased culling for pasture based herds.
  17. **New York Intensive Grazing Farms (Cornell Dairy Farm Business Summary).** Eight year average (1996-2003) for veterinary and treatment costs per cow were \$77 for non-graziers vs. \$61 for graziers.

#### Benefits to Food Safety and Milk Quality

1. **Bailey, G.D., B.A. Vanselow, M.A. Hornitzky, S.I. Hum, G.J. Eamens, P.A. Gill, K.H. Walker and J.P. Cronin. 2003. *A study of the foodborne pathogens: Campylobacter, Listeria and Yersinia in faeces from slaughter age cattle and sheep in Australia.* Comm Dis Intell. 27:249-57.** Prevalence of *Campylobacter* shedding among different management groups was: dairy cattle (6%), feedlot cattle (58%), pastured beef cattle (2%), mutton sheep (0%), prime lambs (8%). All dairy cattle were on pasture.
2. **Fossler, C.P., S.J. Wells, J.B. Kaneene, P. L. Ruegg, L.D. Warnick, L.E. Eberly, S.M. Godden, L.W. Halbert, A.M. Campbell, C.A. Bolin, and A.M. Zwald. 2002. *Cattle and environmental sample-level factors associated with the presence of Salmonella in a multi-state study of conventional and organic dairy farms.* J Dairy Sci. 85:105-111.** Farms with at least 100 cows were more likely to *Salmonella*-positive cattle compared with smaller farms.
3. **Huston C.L., T.E. Wittum, B.C. Love, and J.E. Keen. 2002. *Prevalence of fecal shedding of Salmonella spp. in dairy herds* JAVMA 220:645-9.** Large herd size, intensive management, use of freestalls, and use of straw bedding were associated with *Salmonella* shedding and chronic dairy herd infection.
4. **Husu, J.R. 1990. *Epidemiological studies on the occurrence of Listeria monocytogenes in the feces of dairy cattle.* Zentralb Veterinar B. 37:276-82.** Seasonal variation in shedding of *Listeria* spp. in dairy cattle was examined by collecting 3,878 fecal samples over two years. Prevalence of *Listeria* spp. and *Listeria monocytogenes* was higher during the indoor season than in samples collected from animal on pasture.
5. **Josson, M.E., A. Aspan, E. Eriksson, and I. Vagsholm. 2001. *Persistence of verocytotoxin-producing Escherichia coli O157:H7 in calves kept on pasture and in calves kept indoors during the summer months in a Swedish dairy herd.*** Fecal samples from calves kept on pasture (n=6) and calves housed indoors (n=6) were cultured monthly for five months. Fecals from calves on pasture were negative for this pathogenic *E. coli* were negative on all

sampling occasions. For the indoor housed group, there were between one and six positive individuals at each sampling.

6. **McKinnon, C. H., G.H. J. Rowlands, and A. J. Bramley. 1990. The effect of udder preparation before milking and contamination from the milking plant on bacterial numbers in bulk milk of eight dairy herds. J. Dairy Res. 57:307.** Pastured herds had lower bulk milk total bacteria counts than confinement herds

Nutritional benefits of products from pasture-raised livestock

1. **Ädnøy, T., A. Haug, O. Sørheim, M.S. Thomassen, Z. Varzegi, and L.O. Eik. 2005. Grazing on mountain pastures—does it affect meat quality in lambs? Livestock Prod Sci. 94:25-31.** Meat from lambs raised in extensive systems on mountain range has certain qualities that may be used in promotion of local and regional products.
2. **Aurousseau, B., D. Bauchart, E. Calichon, D. Micol, and A Priolo. 2004. Effect of grass or concentrate feeding systems and rate of growth on triglyceride and phospholipids and their fatty acids in the M. longissimus thoracic of lambs. Meat Sci. 66:531-541.** Muscle lipids characteristic of grass fed lambs fulfilled the recommended features of human food consumption much better than that of stall fed lambs, namely CLA and C18:3n-3.
3. **Dannenberger, D., K. Nuernberg, G. Nuernberg, N. Scollan, H. Steinhart, and K. Ender. 2005. Effect of pasture vs. concentrate diet on CLA isomer distribution in different tissues lipids of beef cattle. Lipids. 40:589-98.** Pasture feeding resulted in significantly increased concentrations of the sum of CLA isomers in Holstein and Simmental muscle tissue.
4. **Elgersma, A., G. Ellen, H. van der Horst, H. Boer, P.R. Dekker, and S. Tammings. 2004. Quick changes in milk fat composition from cows after transition from fresh grass to a silage diet. Anim Feed Sci Tech. 117:13-27.** Average CLA content of milk decreased markedly within two days of switch cows from pasture ration to silage. The milk fatty acid profile of grazing cows was more favourable from a consumer health standpoint than that of silage-fed cows.
5. **Institute of Grassland and Environmental Research. 2004.** Found that organic milk has higher levels of Omega essential acids than the conventional type. Tests carried out on samples at the research centre indicated that organic milk contains two-thirds more omega 3 essential fatty acids than conventional milk.
6. **Kay, J.K., J.R. Roche, E.S. Kolver, N.A. Thomson, and L.H. Baumgard. 2005. A comparison between feeding systems (pasture and TMR) and the effect of vitamin E supplementation on plasma and milk fatty acid profiles in dairy cows. J Dairy Res. 72:322-32.** Milk from cows on pasture or cows feed a TMR supplemented with Vitamin E were compared. Milk from cows grazing pasture had higher CLA, vaccenic acid, and lower trans-10 fatty acids than cows on TMR with supplemental vitamin E. Unknown pasture constituents are likely responsible for the difference.

7. **Nielsen, J., T. Lund-Nielsen, and L. Skibstead. 2004. Danish Research Center for Organic Farming.** Found that organic milk was 50% higher in Vitamin E, 75% higher in beta carotene and higher in omega 3 essential fatty acids than conventional milk. This study tied these qualities to organic cows having room to graze and a diet high in fresh grass and clover, and forage and less maize.
8. **Sonon Jr, R. D. Beitz and A. Trenkle. 2004. *Improving Health Benefits of Beef & Milk: A Field Study*. A. S. Leaflet R1864, Iowa State University.** Intensively pastured cows produced milk with CLA concentrations that were about 3- to 4-fold greater than initial concentrations. Ribeye steaks from cattle finished on a combination of pasture and concentrate were higher in CLA content than steaks from cattle finished on conserved forages plus concentrates
9. **Ward, A. T., K.M. Wittenberg, H.M. Froebe, R. Przybylski, and L. Malcolmson. 2003. *Fresh forage and solin supplementation on conjugated linoleic acid levels in plasma and milk*. J Dairy Sci. 86:1742-50.** Fresh forage, compared to conserved hay, increase milk fat vaccenic acid and CLA proportions by 15 and 22% respectively. Addition of solin seed increased these levels further to 41 and 25%.

#### **Addendum A6 - Soil Benefits From Grazing Dairy Cows**

**The use of pasture for feeding dairy cows vs. the use of stored feeds:**

**By: A. Fay Benson, Grazing Educator with the Cornell University Cooperative Extension**

The benefits of allowing the dairy cow to harvest her own forage through the use of "Rotational Grazing" vs. feeding the cow stored feeds is the result of a number of basic differences in how the feedstuffs are grown. In rotational grazing the forage consumed by the cow is at its peak nutrient density, this grazing stage occurs when the plant is too small physically to be harvested by agricultural machines. Stored forage is allowed to grow to the stage where it is efficient to be harvested by machine. This results in the stored feed not being as nutrient dense and in order to balance the nutrient needs of the cow more grains must be fed. It is from this basic difference that the following benefits of grazing to the environment derive from:

- Grains are all annuals and the soil must be tilled and planted each year, causing erosion from the tilled soil, carbon release from plowing and the resulted Organic Matter loss.
- The cows' manure is deposited on the sod where it is incorporated immediately into the soil by the biological life of the soil. In confinement operations not only is the feed stored but also the manure must be stored, with the eventual loss of gasses such as ammonia and sulfite (Greenhouse gasses).
- The pasture stand secures the soil with its root mass to protect it from erosion caused by wind and rain.

These benefits to the environment are recognized by USDA's Natural Resource Conservation Service (NRCS). Some of the programs that they have developed to encourage the use of pasture are:

- The **Grazing Lands Conservation Initiative** mission is to provide high quality technical assistance on privately owned grazing lands on a voluntary basis and to increase the awareness of the importance of grazing land resources.
- The **Conservation Partnership Initiative** is a voluntary program established to foster conservation partnerships that focus technical and financial resources on conservation priorities in watersheds and airsheds of special significance.
- The **Grassland Reserve Program** is a voluntary program offering landowners the opportunity to protect, restore, and enhance grasslands on their property.
- The **Environmental Quality Incentives Program** was reauthorized in the Farm Security and Rural Investment Act of 2002 (Farm Bill) to provide a voluntary conservation program for farmers and ranchers that promotes agricultural production and environmental quality as compatible national goals
- The **Conservation Reserve Program** provides technical and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner.

**The information below was taken from a paper published by the Illinois NRCS:**

**Impact.** When falling raindrops strike bare soil, the impact causes both splash erosion and soil compaction, resulting in faster runoff and increased erosion. Good plant cover breaks the force of the raindrops, and allows the water to seep into the soil. The soil can act as a large reservoir, holding moisture, reducing flooding and enhancing water quality. Water stored in the soil promotes a greater and more consistent supply of forage.

**Soil.** Coarse soil takes in water faster than fine soil, but stores less within the root zone of most plants. Water that moves below the root zone of plants recharges groundwater supplies, and sometimes reappears down slope as a spring or creek. Because the movement through the soil is slow, the water supply downstream is cleaner, and streams flow longer than where moisture runs off over the soil surface. Where the surface is bare, less moisture enters the soil and surfaces are hotter causing much of the stored water to evaporate during hot, windy days instead of being used for plant growth.

**Plants.** A healthier, more productive grassland water cycle can be achieved by proper grazing. Plants and the litter they produce affect the water cycle in several ways. Plants break the impact of raindrops on the soil surface, and serve as small windbreaks to hold snow. Plants shade the soil's surface causing the soil surface to be cooler, which creates a better environment for plant growth. Litter acts as a sponge, and slows runoff, giving moisture more time to move into the soil. Plant roots increase soil porosity so water moves more readily into and through the soil. Roots also hold soil particles in place, reducing erosion. Vigorous plant cover is an important part of influencing the grassland water cycle, and making effective use of precipitation.

#### **Research supporting grazing over confinement housing:**

Managed grazing is best way to reduce soil erosion on our productive land. Recent **research from Wisconsin's Discovery Farms** has demonstrated that on gently sloping land, land in corn and soy production had up to six times the amount of soil erosion as managed pasture. The rate of soil erosion on the cropped land is not considered sustainable.

**Ontario Ministry of Agriculture and Food, Robert P. Stone and Neil Moore**

Currently, the United States is losing three billion tons of nutrient-rich topsoil each year. Growing corn and soy for animal feed using conventional methods causes a significant amount of this soil loss. Compared with row crops, pasture reduces soil loss by as much as 93 percent.

**Jackson, R. B., J. L. Banner, E. G. Jobbagy, W. T. Pockman, and D. H. Wall.  
"Ecosystem Carbon Loss with Woody Plant**

It's a well known fact that trees draw carbon dioxide from the air and store it as carbon, thereby slowing the rate of global warming. But a new study from Duke University reveals that restoring native grasslands might be a better solution than planting trees in wetter areas of the country. "Grasses are deceptively productive," says lead investigator Robert Jackson. "You don't see where all the carbon goes, so there is a misconception that woody species [such as trees and shrubs] store more carbon. That's just not the case." Grasses store vast amounts of carbon in their underground root mass.

Raising cattle on grass is one way to make it financially feasible to expand our native grasslands. Although cows generate their own greenhouse gasses, the net effect of raising ruminants on pasture is to slow global warming.

**Studemann, J., Fransleubbers, A., Seman, D., 2002, The Role of Animal and Pasture Management in Carbon Sequestration , USDA Agricultural Research Service, Southern Association Of Agricultural Scientists Proceedings;** Carbon stored in soil during the first five years of bermudagrass management was two to three times greater when the grass was grazed than when it was harvested for hay or left unharvested.

**Addendum B**

**Estimating Dry Matter Intake for Dairy cows**

*Example of how to calculate DMI based upon the weight of the cow,  
and average milk production per cow.*

A herd of 100 cows, average weight = 1000 lb/cow, producing 50 lbs of milk. A cow of this size will consume, on average, 3% of her bodyweight per day in Dry Matter.

$$* 1000 \text{ lbs} \times .03 = 30 \text{ lbs dry matter consumed per cow per day (DM Basis)}$$

**If 30% of the total DMI is to be consumed by pasture:**

$$* 30 \text{ lbs} \times .30 = 9 \text{ lbs per cow per day (DM Basis)}$$

100 cows x 9 lbs DM/cow/day = 900 lbs DM needed per day for the herd of 100 cows

\* Note: Pasture, on average is 20% dry matter. With this value, the 9 lbs of pasture on a dry matter basis is equal to 45 lbs of fresh pasture per cow.



## Addendum C

### Estimated Dry Matter Intake by Subtraction Method

#### Herd Average Dry Matter Intake

<b>Non-Grazing Feed Ration</b>
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Average lbs of Hay consumed \_\_\_\_\_ x \_\_\_\_\_ % Dry Matter =  
\_\_\_\_\_ lbs Dry Matter

Average lbs of Balage consumed \_\_\_\_\_ x \_\_\_\_\_ % Dry Matter =  
\_\_\_\_\_ lbs Dry Matter

Average lbs of Corn Silage consumed \_\_\_\_\_ x \_\_\_\_\_ % Dry Matter =  
\_\_\_\_\_ lbs Dry Matter

Average lbs of Grain Consumed #1 \_\_\_\_\_ x \_\_\_\_\_ % Dry Matter =  
\_\_\_\_\_ lbs Dry Matter

**TOTAL LBS DRY**

**MATTER** \_\_\_\_\_

<b>Grazing Feed Ration</b>
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Average lbs of Hay consumed \_\_\_\_\_ x \_\_\_\_\_ % Dry Matter =  
\_\_\_\_\_ lbs Dry Matter

Average lbs of Balage consumed \_\_\_\_\_ x \_\_\_\_\_ % Dry Matter =  
\_\_\_\_\_ lbs Dry Matter

Average lbs of Corn Silage consumed \_\_\_\_\_ x \_\_\_\_\_ % Dry Matter =  
\_\_\_\_\_ lbs Dry Matter

Average lbs of Grain Consumed #1 \_\_\_\_\_ x \_\_\_\_\_ % Dry Matter =  
\_\_\_\_\_ lbs Dry Matter

**TOTAL LBS DRY**

**MATTER** \_\_\_\_\_

<b>Non-Grazing Feed Ration – Grazing Feed Ration = Estimated Pasture Dry Matter Intake</b>
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